

# PIGBLUP Version 5.00

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## Introduction

Version 5.00 of PIGBLUP marks the advent of a fully functional Windows interface to PIGBLUP.

The significance of this re-write resides in

- Its tight linkage with the Microsoft Windows system in regard to:
  - superior printing capabilities,
  - higher resolution graphics and
  - the ability to cut and paste PIGBLUP screens into other programs such as Word and Excel,which will enable more efficient operation by our users.
- Improved performance and ease of use of the interface and a slight improvement in speed of analysis.
- Easier migration of PIGBLUP to the LINUX operating system should option appear viable.
- Use of the object-oriented programming language, Delphi, which will result in a more robust system that as offers a sound framework for future development
- The file *pblup.fig* holds configurational details which persist between PIGBLUP sessions. Now these setting may be displayed and edited online. The new *AnimalIdWidth* parameter permits the user to switch from the default 10-character animal identification to a 12-character identification.

Version 5.00 is almost identical *analytically* with version 4.20 - other than a number of minor bug fixes. In fact, the Version 4.20 analytic modules which are written in Lahey Fortran 90 have been bundled into a dynamic link library (DLL) with minimal changes. PIGBLUP's Windows interface performs analyses by activating modules in the DLL in a separate execution thread. Messages may be passed between the interface and the running module to provide feedback on the status of the analysis and permit the user to terminate execution of the module.

A brief outline of novel aspects of this version is given in the sections below.

## Installation

Installation has been simplified by use of the *InstallShield* installation mechanism. This method should be familiar to people who have installed a Windows application. The user may specify the installation directory then *InstallShield* installs PIGBLUP.

PIGBLUP V5.00 still uses the Rainbow Sentinel security device attached to the printer port to protect the PIGBLUP intellectual property. Thus, the sentinel security driver must be installed as per the PIGBLUP manual in order to operate correctly.

Once installed, the Migrate program that is supplied with PIGBLUP may be run to migrate herds and breeds from any V4.00 or later versions of PIGBLUP to the V5.00 installation directory. On successful completion of the migration, V5.00 is ready to run.

## 1 PIGBLUP's Introductory Screen

The *Introductory Screen* is the screen that appears after you click 'OK' on the PIGBLUP 'pink pig' splash screen.

Existing PIGBLUP clients will notice many changes to the layout of menus and screens. This was inevitable with the migration to Windows.

This re-structuring has enable us to provide some useful new operations and present options in a (hopefully) more logical sequence than previously.

On start-up, the introductory PIGBLUP screen only enables three important options:

### 1.1 Choose Breed

Options available include *Old* (to select an existing herd and breed for analysis), *New* (to create a new herd and/or breed), *Delete* (to remove an existing herd or breeds within a selected herd) and *Tidy* (to delete all regeneratable files in a breed directory – in order to free disk space).

*Old* displays the all currently defined herds and breeds as a herd-breed tree. This structure will be familiar to anyone who has used Windows Explorer. If only the herd is displayed, click the '+' box to reveal all breeds in that herd. In order to select a breed, the breed name must be double clicked.

Note that *New* requires you to select an existing herd or enter the name of a new herd and then enter the name of a new breed. Creating a new herd/breed does not select it for analysis; it just creates the new herd/breed. To select a herd/breed for analysis, *Old* must be used.

### 1.2 Batch Analysis

Once a set of breeds have had their run parameters, trait selections etc set, the breeds can be selected for running as a batch. That is, once one has been run, the next breed in the batch begins its analysis.

The breeds that have all the necessary parameter settings to begin an analysis are identified by their appearing in bold print. Selection of breeds for analysis involves clicking each bold print breed's selection box ('[ ]') with the mouse. To begin the batch analysis, click *Run*.

A batch analysis run window is minimised by default but messages returned by the analytical modules are displayed on the status bar. Also, the breed currently being analysed appears highlighted in the tree of herds and breeds.

### 1.3 Edit Defaults

Whenever you create a new breed, PIGBLUP's default files are copied into the breed sub-directory where they become breed-specific.

The configuration parameters in *pblup.fig*, the default limits, economics and genetic parameters may be edited from *Edit Defaults* sub-menu options. Changes to the default files (other than *pblup.fig*) affect only those breeds created after the changes; no corresponding changes are made to the existing breed-specific parameter files.

The *Analyse Breed* and the *Batch Analysis* menu options are mutually exclusive: when one is enabled the other is disabled. *Analyse Breed* is only enabled when a herd and breed are selected. *Edit Defaults* is always enabled.

## 2.0 Analysing a Selected Breed

All the operations needed when analysing a single breed, are available from this window.

The *Analyse Breed* window provides most of the menu options of earlier versions' Set-Up, Run Breed Analysis, Generate Output, and post-analysis options such as Buyer's Own Index, Genetic Auditing and Mate Selection. That is, these options activate their own windows when selected.

### 2.1 Set-Up: Editing Limits, Economics, Flags and Genetic Parameters

The *limits.txt* and *genpar.dat* files are unchanged from previous versions and *econx.txt* has the same parameters but has been made consistent in layout with the *limits.txt* file.

One difference from previous versions is that the ranges within which minimum and maximum parameter values can be set are now editable online.

In addition, the 'active' flag editing capabilities have been enhanced by:

- Being able to build a list of animal Id's by scanning the data file with animal selection being controlled by a number of conditions,
- Being able to Load, Merge and Delete existing list files,

- Being able to view counts of active and inactive animals by sex and year of birth.

Whenever PIGBLUP detects parameter changes, it disables menu options which are no longer valid. That is, until the breed is re-analysed, the output files are not reflective of the new parameter settings. Once the breed has been successfully analysed, the *EBVs*, *Graph* and *Post-Analysis* menu options are enabled.

## 2.2 Setting Run Parameters

All run parameters will be familiar to previous clients other than the stop criterion and relaxation factors for the multi-trait reproduction analysis are now independently editable from the corresponding production analysis.

The most noticeable change occurs when you select the data file to be analysed. After selecting or entering the file, pressing the *Scan Data File* button results in a scan through the data file to determine the likely data format and sex and breed codes used. PIGBLUP then tries to decide the appropriate Data Format, Boar Code and Castrate Code settings and makes available the set of breed codes for selection. Of course, you still have complete control over which settings are used. In addition, when you place the mouse over the *End of Analysis Date* edit box, a hint will display the date of birth of the last animal in the data file and the most recent end of test date. These are mainly of assistance when wishing to analyse old data extracts and trying to decide suitable end-of-analysis dates.

## 2.3 Performing a BLUP Analysis

A run window is activated that performs the analysis. Status feedback is provided by:

- checking of tasks as they are completed,
- within task messages returned by the running DLL module and displayed on the status bar at the bottom of the window, and
- up-to-date convergence information via convergence graphs.

## 2.4 Viewing Reports

The report viewing window allows you to examine the usual set of files generated during an analysis as well as any other text file on the system.

In order to make run log information more useful and to encourage users to examine certain run information to gauge the success or otherwise of the analysis, selected contents from the run log are split into separate summary files for easier viewing. The summaries include, data file and field statistics, user-defined management group statistics and various fixed effect values previously buried in the run log.

## 2.5 Viewing EBVs and Statistics

Apart from the changes in appearance of this window, it has the same functions as previous versions. However, the graphing of trends has been moved to a separate menu option.

## 2.6 Graphing of Trends

Users will find the trend graphs easier to use and more adaptable than before. This has been achieved by graphing *all* traits when Genetic Trends are requested. When environmental trends are requested, the traits must be selected individually as the management groups and trend options may vary between traits.

Switches have been provided to enable selection of several graph styles (eg line graphs), colour selection, flat vs 3-d graphs, and switching to monochrome for better printing (Delphi's monochrome option will improve hopefully with later releases).

## 2.7 Post-Analysis Options

These options are enabled when PIGBLUP detects that the breed has been analysed successfully. It includes the *Buyer's Own Index*, *Genetic Audit* and *Mate Selection* options.

### 2.7.1 Buyer's own Index

There are no novelties here for existing clients.

### 2.7.2 Genetic Auditing

The only new feature in the Genetic Audit interface is provision for specifying a list of boars and sows to be included in the audit – even if they might otherwise be excluded because of PIGBLUP's conditions on time since last farrowing etc.

### 2.7.3 Mate Selection

Most of the changes in the Mate Selection interface have to do with the creation, editing and management of boar/sow lists and in providing a friendlier mechanism for specifying undesired matings. These should go a long way to answering the requests from existing clients in this area.

Boar/sow lists have a default file extension of *.lst* so that when you want to select an existing list, only the boar/sow lists in the breed directory are listed by default. The list selection dialog does allow for overriding of this default should the boar/sow list sought not have this extension. Also, a *Get Mates* option enables you to build a list by scanning the data extract file subject to a set of conditions.

AGBU intends replacing the previous optimisation algorithm with a more powerful one in 2002.